Operating Instructions
Display and Operating Unit
A200R

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Operating Instructions
Display and operating unit A200R

Read first, then …

Perfect and safe operation requires that this operating instructions as well as the Safety Instructions A200R and VR660 (No. 156 118 and 156 019) have been read and understood!

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1. Mode of operation

A200R in combination with the VR 660 top-hat rail controller serves visualising of measured values, parameterising of parameters and establishing as well as monitoring smaller bus systems.

A200R permits indirect access to connected devices via the installed RS 232 interface. A200R and every connected device may be configured with the CB-Manager configuration software.

After the device has been switched on it searches all bus participants. The parameters are updated and stored in A200R. After the start-up phase, the measured values of all bus participants are cyclically polled.

If a new device with a valid address is connected to the system during operation, it is immediately recognised and the system is extended by this system. A newly added device (in delivery state) is automatically recognised – and a free address is allocated to the device.

An exchange of devices is also possible:

– The old device is removed from the system. A200R keeps all settings of the removed device.
– A new device (in delivery state) is added to the system. This device first receives the address of the old device and subsequently the same configuration which was stored in the old device.

A temperature controller in delivery state has a special device address: 7Fh

A system can be established with preconfigured temperature controllers. This system is automatically recognised after A200R has been switched on – even if another system had previously been stored.

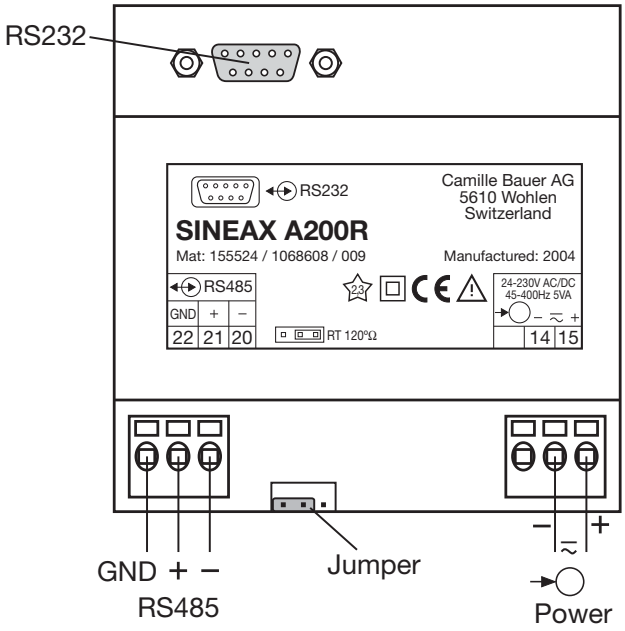
As soon as the system has been established, different actions can be performed. Autotuning may be started or stopped in individual controllers or all connected temperature controllers.

Under no circumstances may several VR660 devices be simultaneously connected to A200R. They must be connected to the bus one after the other!

Therefore, please read carefully about commissioning in Chapter “6. Operation” before switching on the system.

Cyclical polling of the measured values is interrupted while the whole configuration of a device is read or written. This is, for example, the case when a device is exchanged, a new device is added or during the starting procedure.

Connections:



The jumper serves the connection of the terminating resistors to the RS-485 interface.

2. Technical features

Display

LED 7 segment display:	Height 14 mm, colour red
Brightness:	Adjustable

Power →○

Nominal voltage:	24 – 230 V AC/DC, 45 … 400 Hz
Tolerance:	± 15%

Power consumption: 3 W / 5 VA

In case of a voltage > 125 V DC, the power circuit must have an external fuse.

Bus connection ◄⊕►

Interface:	RS-485
Number of controllers:	Max. 32
Bus distance:	Max. 40 m
Terminating resistor:	Can be connected
Bus cycle time:	1 s, adjustable

PC connection ◄⊕► Interface RS-232

Galvanic isolation: All circuits (power/bus/PC connection) are galvanicly isolated

Regulations

Electromagnetic compatibility:	EN 61000-6-2/61000-6-4
Ingress protection:	EN 60029, front IP 66, terminals IP20
Safety:	IEC or EN 60010
Operating voltages:	< 300 V between all insulated circuits
Degree of pollution:	2
Overvoltage category according to IEC 664:	II
Double insulation:	Between all insulated circuits
Test voltage:	2.3 kVrms, 50 Hz
Environmental tests:	EN 60068-2-1/-2/-3/-6/-27

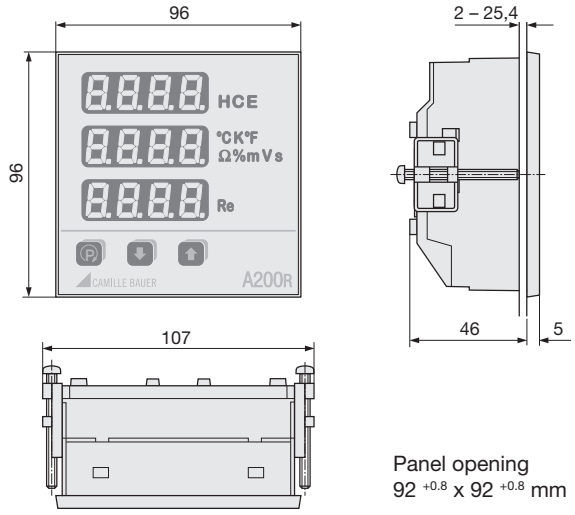
Ambient conditions

Operating temperature	– 25 … 55 °C
Storage temperature:	– 25 … 70 °C
Relative humidity, annual average:	≤ 75%, no dew
Functional range:	Indoors up to 2000 m above sea level.

Installation

Connections:	Power, bus connection: Cage clamps, cross section single-wire and fine-wire: 0.5 – 1.5 mm²
	PC connection: 9-pole D-sub female

Dimensional sketch



Panel opening
92 $^{+0.8}$ x 92 $^{+0.8}$ mm

Slave addresses: Device addresses cannot be freely chosen: Permitted are values 1 … 32 and the device address in the delivery state (7Fh).

The best performance of the system is achieved if address allocation starts with 1 and does not have any gaps.

Each address may occur only once in the system.

Automatic address allocation: The system can be developed and extended by adding one device after the other. Each temperature controller in delivery state receives a valid device address after it has been connected to the system.

Automatic system recognition: After it has been switched on. A200R searches all connected devices. If another device is added during operation the same is also recognised if it has the address 7Fh or an address which does not exceed the maximum address in the system plus 1.

Process image: A200R acquires cyclically the variables (status, actual value, regulated ratio and setpoint) of all connected devices and stores them in RAM.

The non-volatile parameters of all devices are stored in EEPROM of A200R.

This data is always available in a higher-ranking system.

Pre-engineering: Data transfer does not only proceed from A200R to a higher-ranking system but also vice versa. After the configurations of the temperature controllers have been stored in A200R, they are automatically transferred to the respective controller.

Visualising: The process data of all temperature controllers can be selected at the display. The scroll status shows the data of each device one after the other. If an error occurs, it is automatically indicated, irrespective of which controller is currently visualised.

Heating and cooling of the controller is displayed for controller parameter monitoring.

Parameter entry: Every device parameter may be displayed and individually entered.

Access authority: The access via the operating panel may be specified:
– Full access
– Access to controller parameter
– Access to setpoint
– No access
The access is set using CB-Manager configuration software.

Autotuning: Autotuning may be started in an individual controller or all controllers simultaneously.

Copying of configurations: Commissioning is significantly simplified if the parameters are first set in one controller and subsequently copied to all other devices.

Exchange of devices: The new device in delivery state receives the device address and all parameters of the removed device.

A200R parameter

Description	Setting range	Default	UNIT
Configuration date			
Device address	1…32, delivery state 7Fh	Delivery state	–
TAG	–	"A200R"	–
Brightness	0 … 12	8	–
Unit for display of figures	°C K °F	°C	– – –
Display bus cycle time	1 … 20	1	s
Access authority	Setpoint +On/Off Control parameter +On/Off Full access	Full access	– – –

3. Overview of display and operating elements

Keys	Duration	Measured value display	Programming-mode	Entry floating point figure	Entry of whole numbers
↑	Short	Device selection	Leave menu (change to a higher-ranking menu)	Increment digit	Increment
	Long	Increase brightness		Automatic incrementing of figure	Automatic incrementing
↓	Short	Device selection	Select menu (next menu level)	Decrement digit	Decrement
	Long	Decrease brightness	Scrolling of menu levels	Automatic decrementing of figure	Automatic decrementing
P	Short	Selection of display level	Executive menu level (or call lower-ranking menu)	Select next digit	Terminate entry (the value is stored)
	Long	Programming mode	Leave programming mode	Leave programming mode (the value is stored immediately)	Leave programming mode (the value is not changed)
↓ + ↑	Short			Cancellation of entry (the value is not changed)	Cancellation of entry (the value is not changed)
	Long	Device reset	Device reset	Device reset	Device reset
P + ↑	Short	Automatic scrolling of devices Start/Stop	Next device		
	Long				
P + ↓	Short		Previous device		
	Long	Direct selection (adjust setpoint 1)			

Display levels for measured values

Device address					
	No.	a	b	c	d
	All				
	1	<No> <Actual value> <Setpoint>	<No> <Regulated ratio> OUt.A	<No>, <No> Deviations of 8 devices: Horizontal bars	<No> <Status> StAt *)
	2				
	3				
	:				
	32				

*) Errors are indicated by a flashing Err.A instead of StAt .

Temperatures are indicated by 4 digits, i.e. in case of temperatures below – 199.9 or above 999,9 the digit behind the point disappears.

It is very important, at which point one changes to be programming mode. Parameter settings for controllers and actions always refer to the set device address. “All” is a special case and permits actions in all connected controllers. E.g. starting autotuning simultaneously in all devices.

Different statuses are indicated during the measured value display:

1) If autotuning is started, the progression of optimising can be seen on the line right at the bottom during the whole optimising phase. The optimising status is indicated by flashing letters, i.e. tUn followed by a figure (1 … 7):
   tUn2
2) If a new device (in delivery state) is added to the system, a flashing Add.A indicates on the line right at the bottom that the device is being added to the system. Subsequently, the parameters are read by the device (rEAd).
3) A device exchange is indicated on the line right at the bottom by a flashing: rEPL
4) Automatic scrolling of the individual devices is indicated on the first line.
   Sc.A.A appears instead of Ad.A.A .

Data values of the connected devices may be automatically scrolled:
Simultaneous pressing of these keys starts scrolling.
Scrolling is terminated in the same way.

Please observe: Pressing the key can change the display level. You return to the desired display level using the key.

Display of error variables of 8 temperature controllers:

Display: Controller 9 … 16 During starting		Display: Controller 1 … 8 Status: After the setpoint has been reached	Display: Controller 1 … 8 Error in	
a) > 10%	b) 5%…10%		a) all devices	b) Device 1
A.9.16	A.9.16	A.1.A.8	A.1.A.8	A.1.A.8
A.A.A.A	- - - -	- - - -	EEEE	E - - -
A.A.A.A	- - - -	- - - -	EEEE	- - t -

Status and error information

Display	Status	Description	
	Device is offline	The controller is switched off in this status. The outputs are not active and autotuning cannot be performed. The measuring signal is available.	
	Binary input	The binary input is activated. The controller performs the configured measure (e.g. second setpoint).	
	No status information		
Display	**Type of error**	**Description**	
	Communication error BUS communication	Communication error in norm BUS cycle. The corresponding device is indicated. Measured value polling of other devices is not interrupted.	
	Communication error No more memory available	Storing data in the device is endeavoured despite a communication error. In this case, the data is buffered until the communication works properly again. If the amount of data is too big, this is indicated. This state must be manually stopped (e.g. by removing the defective device and performing a device reset).	
	Sensor breakage	One or serveral connections to the temperature sensor are interrupted	Available status information is automatically scrolled if more than one error status exists.
	Sensor short circuit	The sensor value measured by resistance thermometers is too low	
	Polarity reversal Thermocouple	Polarity reversal is monitored in the following cases: – The start of the measuring range exceeds or equals 0 °C – The end of the measuring range is below or equals 0 °C	
	Heating defect	If the heating is on for a certain time and the temperature does not increase, this represents a heating defect. The heating circuit is not monitored in the following cases: – Controller is offline – During autotuning – Controller does not have any I-portion	
	Tuning error	Autotuning is stopped in different situations: – Device is offline – No valid measured value (e.g. sensor breakage) – In limit value alarms – The minimum regulated ratio is not smaller than 0 in a 3-state controller	
	Version error	If A200R is not compatible any more to a new VR660, this is indicated as a version error. It is not possible to set parameters of this device. In this case, a current A200R must be used.	
Display	**Additional information**	**Description**	
	Communication error Error during storage in the device or when triggering an action	Errors have occurred when accessing the device and these cannot be rectified despite repeated access procedures. The normal BUS cycle is now interrupted and the procedure repeated until the connection to the device has been established again. If the connection cannot be re-established, this status must be stopped manually (e.g. by removing the defective device and performing a device reset)	

4. Menu structure

Settings VR660

- dEu — Device settings
  - Addr — Device address VR660
  - StAt — Group
    - onLn / oFLn — Online / Offline
- MEAS — Measured value
  - LoCA / HiCA — Measuring range minimum and maximum
  - oFS / GAIn — Offset and gain calibration
  - SEnS — Sensor type
    - U — Voltage mV
    - tc.i / tc.E — Thermocouple internal, external
      - b tc / E tc / J tc / A tc / L tc / n tc / r tc / S tc / t tc / U tc / c tc / d tc — Thermocouple Type B, E, J, K, L, N, R, S, T, U, C, D
    - rtd2 / rtd3 / rtd4 — Resistance thermometer 2/3/4-wire
    - r 2L / r 3L / r 4L — Resistance
      - Pt / ni — Sensor material
        - SEnS — 100.0 Value at 0 °C
  - rEF — Reference temperature/Lead resistance
- CtrL — Controller settings
  - SEtP — Setpoint
    - SEt 1 / SEt2 — Setpoint and second setpoint
    - LoSP / HiSP — Lower and upper setpoint limit
    - PSEt / nSEt — Positive and negative setpoint ramp
    - bi AS — Increase, decrease autotuning
  - tYPE — Controller type
    - 2P H / 2P C / 3P — 2-state PID (heating, cooling), 3-state PID
  - PArA — Control parameter
    - Pb 1 / Pb 2 — PB: Proportional band
    - tv 1 / tv 2 — Tv: Rate time
    - tn 1 / tn 2 — Tn: Reset time
    - tC — Cycle time
    - dbnd — Dead band
  - ProF — Specify setpoint profile
    - no — Number of profile values
    - t 1 / SP 1 — Time T1, setpoint SP1
    - t 10 / SP 10 — Time T10, Setpoint SP10
  - y — Regulated ratio
    - y H / y L — Regulated ratio (max., min.)
    - y E / diSt — Regulated ratio in case of an error feedforward control
- SEt — Settings
  - Strt / ProF / PEr / yErr / LrEL — Settings:
    - Start connection
    - Setpoint profile
    - Periodical setpoint profile
    - Specify regulated ratio in case of an error
    - Relative limit values
    - oFF / SEt — deactivated, activated
- out — Outputs
  - dir — Effective direction
    - out1 / out2 / out3 / out4 — Effective direction of outputs
      - nor / rEv — Normal, inverted
  - ALrS — Alarms
    - out3 / out4 — Alarm outputs 3 and 4
      - Li.1 / Li.2 / br / SHrt / oUt / tc / bUS — Alarm in one or more conditions:
        - Limit value 1
        - Limit value 2
        - Sensor breakage
        - Sensor short circuit
        - Heating loop cut
        - Reverse polarity of thermocouple
        - Timeout communication
        - oFF / SEt — No alarm, alarm
- inP — Binary input
  - nonE / tUnE / onLn / SEt2 / diSt / Strt / ProF — No action, autotuning, device online/offline, second setpoint, feedforward control, limit value alarm suppression, start setpoint profile
- LiMt — Limit value settings
  - on 1 — Limit for ON state limit value 1
  - oFF1 — Limit for OFF state limit value 1
  - on 2 — Limit for ON state limit value 2
  - oFF2 — Limit for OFF state limit value 2

Key navigation

	Measurem.	Program Mode	Figure	Address
↑	● Device	● Leave menu	● Figure +1 ■ scroll	● next ■ scroll
↓	● Device	● Select menu ■	● Figure –1 ■ scroll	● Previous ■ scroll
P	● Display ■	● Execute menu ■	● confirm	● confirm
↑ ↓	■ Reset	■ Reset	● No change (leave)	● No change (leave)
P ↑	● Scroll Mode	● Next device		
P ↓	■ Setpoint	● Previous device		

Press ● short ■ long

Actions

- Strt — Start of actions
  - tUnE — Strt / StoP — Start, stop autotuning
  - StAt — onLn / oFLn — Online, Offline
  - ProF — Strt / StoP — Setpoint profile
  - coPy — to23 — Copy configuration
  - tnrL — Lead calibration

Settings A200R

- diSP — Display settings
  - Addr — Display address A200R
  - Unit — Temperature unit (°C, °F, K)
  - tCYC — Bus cycle time

5. Programming

Press this key long for programming.

Pressing the same key briefly selects the respective menu level.

The flashing content may be changed with these keys .

Entering of a number: The respective numbers or figures are changed with the arrow keys . The process is speeded up (changing to the next higher figure) by pressing the key permanently. The changed value is stored automatically after a short period of time or immediately by pressing the key.

Navigation within a menu is as follows:

– Select menu:

– Execute menu level:

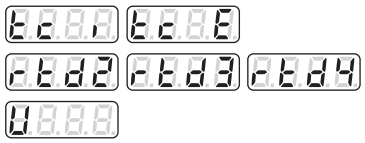
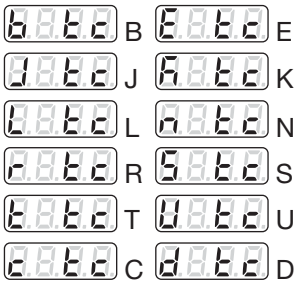
– Leave menu level:

Device settings

	Menu	Options	Comments
Device address setting		1, 2, 3 … 32	The device selection (address) is performed in the “Display of measured values” mode. This device address is changed in programming. Only free addresses may be selected, i.e. the addresses of devices connected to A200R are not offered for selection in the menu. After the address has been changed the display device restarts, searches all devices connected to the BUS and reads the configuration of these devices.
Device Active / inactive			In delivery state the temperature controller is inactive. The user must activate the controller for controlling. Please take into consideration that in inverted digital outputs the respective output is active despite the deactivated state.

Measuring input setting

	Menu	Options	Comments
Measuring range minimum value		Enter value	The measuring range is entered in the unit which has been set in the “Unit” menu. The measuring range can be entered within the sensor limits. It is recommended to set a measuring range which is large as possible. Temperature controlling is more efficient if the temperature is within the measuring range during starting.
Measuring range maximum value		Enter value	

	Menu	Options	Comments
Offset calibration		Enter value	Offset correction of measured temperature: – 10 … 10% of measuring range
Gain calibration		Enter value	Gain correction of measured temperature. Setting range: 90 … 110% of measuring range
Select measuring method			Thermocouple internally/externally compensated Resistance thermometer 2/3/4-wire Voltage
Reference temperature, lead resistance		Enter value	Reference value in temperature measurement: – Reference temperature externally compensated in thermocouple – Lead resistance in 2-wire measurement
Select thermocouple			The characteristic curves of all temperature sensors listed here are stored in the temperature controller
Select resistance sensor			After the entry of the material (platinum, nickel) the value is entered at 0 °C. Example: 100.0 for Pt 100

Controller settings

	Menu	Options	Comments
Setpoint 1		Enter value	The first setpoint is entered in the unit set in the “Unit” menu. The setpoint can be entered within the setpoint limits.
Setpoint 2		Enter value	The second setpoint is entered in the unit set in the “Unit” menu.
Setpoint limit Upper limit		Enter value	The setpoint limit is entered in the unit set in the “Unit” menu.
Setpoint limit Lower limit		Enter value	The setpoint limit is entered in the unit set in the “Unit” menu.

	Menu	Options	Comments
Positive setpoint ramp	SEtP PSEt 0.0.0.0	Enter value	The value indicates the positive setpoint rise (unit/min). The unit is the same as the unit of the setpoint.
Negative setpoint ramp	SEtP nSEt 0.0.0.0	Enter value	The value indicates the negative setpoint rise (unit/min). The unit is the same as the unit of the setpoint.
Setpoint decrease in autotuning	SEtP bIAS 0.0.0.0	Enter value	The oscillation test can be conducted at a different setpoint in order not to exceed the setpoint during autotuning. “Bias” is the value which is added to the current setpoint when autotuning is started.

	Menu	Options	Comments
Controller type	CtrL tYPE 2P H	2P H 2P C 3P 0.0 2-state heating 2-state cooling 3-state	
Control parameters	CtrL PAr 0.0 Pb 0.1	Pb 0.1 Pb 0.2 tu 0.1 tu 0.2 tn 0.1 tn 0.2 tC 0.0 dbnd	Control parameters: – Proportional band 1 and 2 – Rate time – Reset time – Cycle time – Dead band (3-state)
Specifying setpoint profile	CtrL Prof no 0.0	no 0.0.0 t 0.0.0.1 SP 0.0.1 : t 0.0.10 SP 0.10	The setpoint profile consists of – The number of supports – Time values in seconds – Setpoints After the selection of the time or the setpoint the corresponding parameter is entered as a numeric value. A defined setpoint profile is not active by itself, i.e. one of the other settings must be effected: – Activation by the binary input – Activation configured in the settings

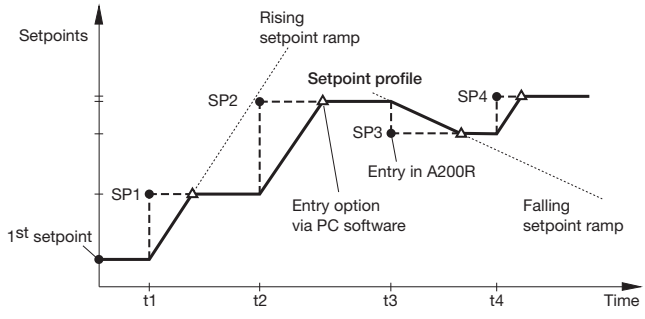
Please note:

These table values are the setpoints at the time the setpoint ramp starts. This should not be confused with the entry in the configuration software.

The configuration software offers the option of entering the time at which the setpoint is reached.

A200R stores the table values which can also be entered in the A200R menu.

The following diagram illustrates the interdependencies:



Entry of controller parameters

	Menu	Options	Comments
Controller parameters Pb1, Pb2	PAr.0 Pb.01 0.0.0.0	Enter value	The proportional band is stated in the unit of the input range.
Controller parameters Tv1, Tv2	PAr.0 tv.01 0.0.0.0	Enter value	Unit of the rate time: Seconds
Controller parameters Tn1, Tn2	PAr.0 tn.01 0.0.0.0	Enter value	Unit of the reset time: Seconds
Regulated ratio	CtrL y.0.0 y.0.0H	y.0.0H y.0.0L y.0.0E dist	You select: – Regulated ratio limits – Regulated ratio in case of an error – Disturbance variable regulated ratio

Outputs

	Menu	Options	Comments
Effective direction of outputs 1 … 4	dir.0 out1 nor.0	nor.0 rEv.0 You have to take into consideration that an inverted output is also inverted in the offline status. If the effective direction is incorrectly set at the output, the heating is fully switched on in the offline status.	Effective directions of output 1 … 4 may be entered. Normal / reverse ⚠
Alarm outputs 3, 4	ALr5 out3 Lim1 ALr5 out4 tc.0.0	Lim1 Lim2 br.0.0 SHrt out.0 tc.0.0 bUS.0	An alarm may be selected for different conditions: – Limit value 1 – Limit value 2 – Sensor breakage – Sensor short circuit – Cut of heating loop – Polarity reversal thermocouple – Timeout communication Alarm set / off SEt.0 oFF.0

Settings

	Menu	Options	Comments
Settings	SEt.0 Strt 0.0.0.0	StrtPrdF PErr YErr LrEL	– Starting circuit – Setpoint profile active – Setpoint profile periodical – Specify regulated ratio in case of an error – Relative limit value

In certain settings, those procedures are deleted which can also be set without the binary input and which might lead to conflicts with the binary input.

– The setpoint profile may not be configured as active if the binary input activates the setpoint profile.
– The starting circuit may not be firmly configured if the same is controlled by the binary input.

Binary input

	Menu	Options	Comments
Action when activating the binary input	inP.1 nonE 8.8.8.8	nonE tUnE onLn SEt2 diSt Strt PrOF	– No action – Autotuning – Device Online/Offline – Second setpoint – Feed forward control – Limit value alarm suppression – Start setpoint profile

In certain settings, those procedures are deleted which can also be set without the binary input and which might lead to conflicts with the binary input. (Starting circuit, setpoint profile).

Alarm settings

	Menu	Options	Comments
Limit values	LiMt on.1 8.8.8.8	on.1 on.2 oFF1 oFF2	On-state and off-state points of limit value 1 and limit value 2. If the on-state point is higher than the off-state point, this involves an upper limit value. In a lower limit value, the on-state point is smaller than the off-state point.

Starting actions

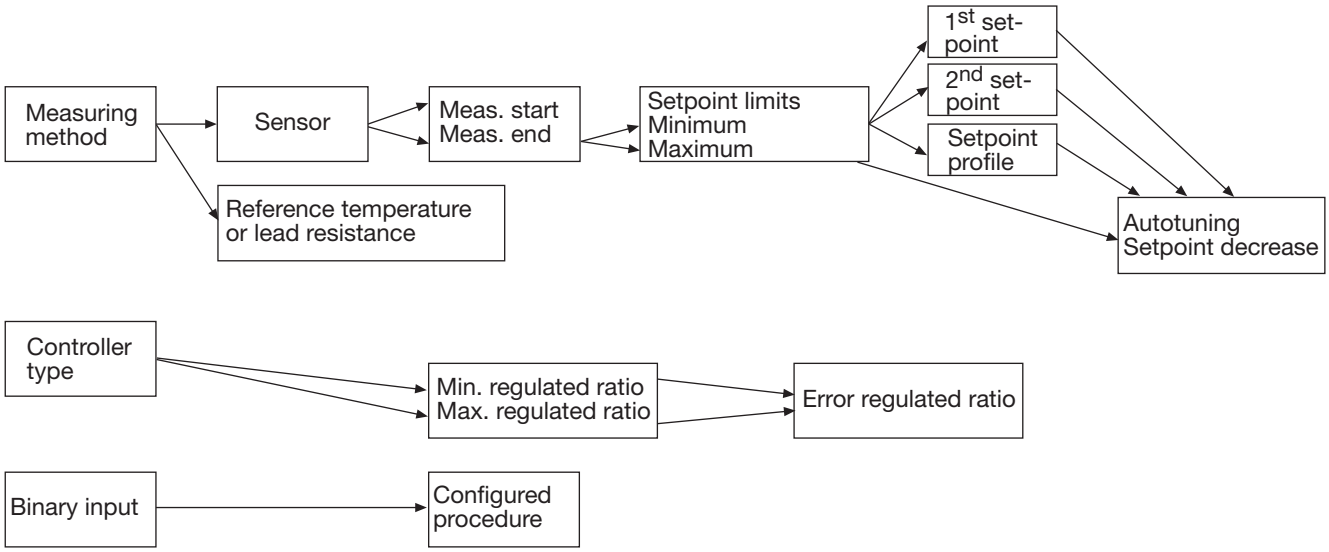
	Menu	Options	Comments
Action	Strt tUnE 8.8.8.8	tUnE StAt PrOF coPy tnrL	– Start/stop autotuning – Online/Offline – Setpoint profile – Copy configuration to another device – Lead calibration Autotuning: The current status of autotuning is indicated (e.g. tUn2) An error leading to a cancellation of autotuning is subsequently displayed. Autotuning must then be stopped.

Display settings (A200R)

	Menu	Options	Comments
Unit	diSP Unit 8.8.8.8	(°C, °F, K)	The display unit is an A200R parameter and is not stored in the controller.
Bus cycle time	diSP tCyC 8.8.8.8	8.8.8.8	The bus cycle time is entered in seconds.

Dependencies of different parameters

There are parameters which are dependent on other parameters. For example, the permitted measuring range depends on the selection of the sensor type. Setpoint limits are dependent on the set measuring ranges – and setpoints must be within setpoint limits. It is, nevertheless, possible to set each parameter individually. For example, the sensor type may be changed despite the fact that the old measuring range does not agree with the new sensor type. In such cases, the parameters which are dependent on others are automatically adapted. However, this means that, e.g., the measuring range also changes after the selection of a sensor.



After a parameter has been entered, A200R causes VR660 to correct the dependent parameters. In the procedure shown above, all parameters to the right of the selected parameter are corrected. For example, after the entry of the measuring start the setpoint limit and all setpoints are corrected in such a way that they are afterwards within the measuring range.

If A200R cannot get a parameter adaptation (e.g. due to an interrupted bus connection), VR660 behaves like in case of an error (keeps its last regulated ratio) until this has been corrected.

6. Operation

The temperature controllers are subject to special commissioning instructions!

Activation

After activation, the version is shown on the display (A200/1.00). Subsequently, connected devices are searched.

Commissioning

a) With pre-configured VR660 devices

The temperature controllers are configured using the CB-Manager configuration software. It is important that each device gets a different device address since otherwise BUS communication is not possible.

The temperature controllers are connected to A200R before its activation. After A200R has been switched on, all devices connected to the bus are recognised and their configuration is read. A200R stores the configuration data of all connected devices.

VR660 devices in delivery state may not be simultaneously connected to A200R under any circumstances. They must be connected to the bus one after the other!

b) With VR660 devices in delivery state

All devices have the same device address. Therefore, they have to be connected to the BUS one after the other. The newly connected device is recognised by A200R and automatically receives a new device address.

After the new device has been energised, the same is shown on the display (AddA) and the current configuration data is read by the device.

Inserting temperature controllers into an existing system

The procedure is exactly the same as for commissioning devices in delivery state. Every time a new device is added it is automatically recognised: The display adds the device to the list (AddA) and reads the configuration of the controller.

The following limitations apply to devices with valid addresses: The device address may not be bigger than the maximum address previously used in the system plus one (Example: If

the maximum address in the system is 7, the address of the newly added device must be exactly 8). However, if after the addition of the new device, a reset of A200R is performed, this limitation is not applicable – and all devices are again recognised. Also in this case it is of importance that each device address exists only once in the system.

Change of the device address of the temperature controller

Addresses 1 … 32 as well as the device address in delivery state may be set.

After the device address of the temperature controller has been changed, A200R restarts.

If the device address in delivery state is set, this device must be removed from the BUS. Otherwise, A200R would immediately allocate a new address to this device. Therefore, a request is flashed ( ) until the user removes the temperature controller. After the removal of the temperature controller, A200R restarts.

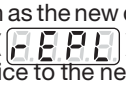
Exchange of devices

The exchange of a device is only possible if it has the delivery state address. The device address may be reset using the configuration software.

A prerequisite is the correct BUS operation, i.e. no communication errors may occur between A200R and the temperature controller. Only one device may be changed at any one time.

As the device to be replaced is removed, this action is recognised by the lack of communication with this device. A200R flashed this error status (bUS/Err).

A200R may not be switched off now until the exchange has been completed.

As soon as the new device has been connected, it is recognised by () and allocates the device address of the old device to the new device. Subsequently, the new device receives the configuration data of the old device.

Copying the configuration from one VR660 to another VR660

If a portable computer is not available during commissioning and if the devices have not been pre-engineered, commissioning is laborious.

The function “Copying configuration” makes commissioning of several devices of the same kind considerably easier: Initially, the first controller is set using A200R. Subsequently, the configuration of this device may be copied to all controllers connected to the system.

Pre-engineering of the system

A system may be pre-engineered with a PC so that a portable computer is not required for commissioning. A200R is programmed at the office and later used in the target system.

The configurations of all controllers are stored in A200R. If the master is now connected to a system, it can store the saved data in the devices. A prerequisite is that the existing system agrees with the pre-engineered system because A200R has stored the number of devices the system should finally have.

The system can now be individually developed (e.g. with device addresses in delivery state) or with pre-configuration device addresses. The storing process is terminated as soon as the last device has been connected to the system.

In pre-engineering one should note that A200R is initialised without connected devices (device reset) and that the configurations are stored in A200R in this status.

After successful downloading, this setting is automatically set back (again to reading) so that A200R may be able to react correctly to changes in the system. If A200R must be used several times, the “Store configurations” mode has to be newly set prior to removing A200R from the system. If the mode has been reset to “Storage”, configurations may subsequently not be stored in the devices since the write mode would otherwise be deleted again.